MA 122: Worksheet 5

Discussion on 2/29 or 3/2

**PROBLEM 1.** Find and draw the domains of the following functions.

a) \( f(x, y) = \frac{1}{\sqrt{1 - x^2 - y^2}} \)

b) \( g(x, y) = \sqrt{x^2 + y^2} \)

c) \( h(x, y) = \ln(xy) \)
Problem 2. Describe the cross sections (i.e. the functions you get by setting $x$ to a constant and then $y$ to a constant) of the following functions:

a) $f(x, y) = x^2 - x - y^2 + 5y - xy + 4$

b) $g(x, y) = x^2 + e^y$

c) $h(x, y) = \sqrt{1 - x^2 - y^2}$
PROBLEM 3. Find and describe the local extrema of the following functions:

a) $x^2 - 2xy - y^2 + 10x - 6y$

b) $x^6 + y^3 + 6x - 12y + 7$